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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,863	02/27/2004	Joseph H. Sassine	I69.12-0600	7195

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EXAMINER	
WATKO, JULIE ANNE	

ART UNIT	PAPER NUMBER
2627	

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05/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/788,863	SASSINE ET AL.	
	Examiner	Art Unit	
	Julie Anne Watko	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-16,18-20 and 26-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16,18-20 and 27-31* is/are allowed.

6)☒ Claim(s) *1-3,5-12,26 and 32* is/are rejected.

7)☒ Claim(s) *13-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/27/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/07/2008 has been entered.

Claim Rejections - 35 USC § 112

2. The indefiniteness rejections have been overcome by argument.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-3, 5-12, 26 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arya et al (US Pat. No. 6785094 B2) in view of Sutton et al (US Pat. No. 5965249).

As recited in claim 1, Arya et al show a head suspension assembly 100, comprising: a beam component 110 having a front end (right end in Figs. 7-8) and a rear end (left end in Figs. 7-8); a hinge component 108 near the rear end (left end in Figs. 7-8) of the beam component for connecting to an actuation arm (see 104); and a gimbal component 120 near the front end of the main beam section for carrying a transducing head (see 22 and 20); wherein the hinge component 108 comprises a first structural damping material and the gimbal component comprises a second structural damping material.

As recited in claim 1, Arya et al are silent regarding whether the first structural damping material has a damping capacity greater than approximately 0.02 and a modulus of elasticity greater than approximately 10 gigapascals and whether the second structural damping material has a damping capacity greater than approximately 0.02 and a modulus of elasticity greater than approximately 10 gigapascals.

As recited in claim 1, Sutton et al show structural damping materials for use in disk drive suspensions (see col. 12, lines 66-67), said materials having a damping capacity greater than approximately 0.02 (see, e.g., Fig. 19). Furthermore, Sutton et al disclose structural damping materials having a modulus of elasticity greater than approximately 10 gigapascals (see, e.g., Fig. 18). Moreover, Sutton et al teach that "materials are needed with improved dynamic loss moduli and sufficient tan δ" (see col. 4, lines 12-13), wherein "all references to dynamic loss and storage moduli will refer to Young's Moduli" (see col. 2, lines 5-6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to arrive at the claimed ranges of modulus of elasticity and damping capacity for the suspension of Arya et al as taught by Sutton et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to improve dynamic loss moduli and achieve sufficient damping capacity across the various frequency bands important for disk drive suspensions as taught by Sutton et al (see col. 4, lines 10-19).

As recited in claim 2, Arya et al are silent regarding whether the first structural damping material has a modulus of elasticity greater than approximately 30 gigapascals, and the second structural damping material has a modulus of elasticity greater than approximately 30 gigapascals.

As recited in claim 2, Sutton et al show structural damping materials having modulus of elasticity greater than approximately 30 GPa.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the materials of Sutton et al in the suspension of Arya et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to achieve sufficient damping capacity across the various frequency bands important for disk drive suspensions as taught by Sutton et al (see col. 4, lines 10-19).

As recited in claim 3, Arya et al show that the first structural damping material and the second structural damping material are substantially identical in composition (insofar as both consist of the 3rd, 4th and 5th layers of Arya et al).

As recited in claim 5, Arya et al show that the hinge component 108 applies a preload ("hinge enables the load beam to suspend and load the slider and the read/write head toward the spinning disk surface", see col. 1, lines 32-34) on the transducing head (see 22 and 20) through the beam component 110.

As recited in claim 6, Arya et al show that the entire hinge component 108 is substantially made from the first structural damping material (3rd + 4th + 5th layers laminated together) only.

As recited in claim 7, Arya et al show that the entire gimbal component 120 is substantially made from the second structural damping material (3rd + 4th + 5th layers laminated together) only.

As recited in claim 8, Arya et al show that the hinge component 108 has no external structural damping material attached thereto (see Fig. 6).

As recited in claim 9, Arya et al are silent regarding whether the first structural damping material has a modulus of elasticity greater than approximately 50 gigapascals.

As recited in claim 9, Sutton et al show a structural damping material having a modulus of elasticity greater than approximately 50 gigapascals (see Fig. 22).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the materials of Sutton et al in the suspension of Arya et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to achieve sufficient damping capacity across the various frequency bands important for disk drive suspensions as taught by Sutton et al (see col. 4, lines 10-19).

As recited in claim 10, Arya et al are silent regarding whether the second structural damping material has a modulus of elasticity greater than approximately 50 gigapascals.

See teachings, rationale and motivations above for claim 9.

As recited in claim 11, Arya et al show that the first structural damping material is an alloy (insofar as it comprises the steel 3rd layer).

As recited in claim 12, Arya et al show that the first structural damping material is a laminate comprising a stainless steel layer (3^{rd} layer) and a damping material layer (4^{th} layer).

As recited in claim 26, Arya et al are silent regarding whether the first structural damping material is a composite.

As recited in claim 26, Sutton et al teach the use of composite (see Figs. 1-2) structural damping materials (see col. 4, line 33-col. 5, line 17) in disk drive suspensions (see col. 12, lines 66-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the composite material of Sutton et al in the suspension of Arya et al as taught by Sutton et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to achieve sufficient mechanical strength and integrity to provide good performance characteristics, including structural integrity in a suspension where damping is required in conjunction with long term mechanical integrity as taught by Sutton et al (see col. 5, lines 12-17).

As recited in claim 32, Arya et al show that the second structural damping material is an alloy (insofar as it comprises the steel 3rd layer).

Allowable Subject Matter

5. Claims 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 16, 18-20, and 27-31 are allowed.

Response to Arguments

7. Applicant's arguments with respect to claims 1-3, 5-12, 26 and 32 have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments with respect to claims 13-16, 18-20 and 27-31 have been considered and are persuasive with respect to those claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Arya (US Pat. No. 6731466 B2) shows a suspension with integral constrained and sandwiched layer damping (see especially Fig. 8).

Dauber et al (US Pat. No. 5761184) teach that "Additional areas of use in FIG. 1 are areas 22 and 23 on the head gimbal assembly (HGA) 14, and armature 15, respectively. The vibration damping article is disposed at these locations for improved performance, rather than for sound damping. Performance of the drive depends upon the speed and accuracy of the head 13 to be able to read and write data from the recording media disks 11. The typical flying height or distance between the head and disks is less than 0.000002" (e.g., about 0.000051 mm). Vibrations on the armature that causes undesired movement of the position of the head is detrimental to the ability to accurately read and write data within the small data tracks on the disk."

Wright (US Pat. No. 7224554 B2) shows composites and laminates for disk drive suspensions (see especially Figs. 4-5) and is commonly assigned with the instant patent application.

Lim et al ("Design and Load/Unload Performance of Hard Disk Drive Suspension Integrated With Shape Memory Alloy Thin Film", IEEE Transactions on Magnetics, v. 43, no. 5, p. 2019-2024, May 2007) teach controlling suspension vibration with NiTi shape memory alloy.

Çolakoğlu ("Damping and Vibration Analysis of Polyethylene Fiber Composite under Varied Temperature", Turkish J. Eng. Env. Sci., no. 30 (2006), p. 351-357) shows a fiber composite having elastic modulus E = 25.5 GPa (see p. 355).

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (571) 272-7597. The examiner can normally be reached on Mon & Fri, 9:30AM to 7:30PM, Tues-Thurs after 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Julie Anne Watko/
Primary Examiner, Art Unit 2627

May 24, 2008
JAW